AN INTRODUCTION TO GENERATIVE ARTIFICIAL INTELLIGENCE

November 26, 2024

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Ontario Teachers' Federation

Fédération des enseignantes et des enseignants de l'Ontario

STUDENT TASK PROMPT

Write a five paragraph essay that compares and contrasts "A Handmaid's Tale“ by Margaret Atwood with current political issues affecting women in Canada. Provide specific quotes from the book and relevant media headlines to defend positions taken in the essay.

A LESSON PLAN WRITING PROMPT

Write a lesson plan with these two learning expectations, "read, represent, compare, and order decimal numbers up to hundredths, in various contexts" and "round decimal numbers, both terminating and repeating, to the nearest tenth, hundredth, or whole number, as applicable, in various contexts". Use the following task in the lesson "Adapt the clothesline number line to focus on rounding decimals. Using a clothesline with the cards 5 and 6 pinned at opposite ends, support students in subdividing and labelling the space by tenths (5.1, 5.2, 5.3, and so on)". There should be small group learning for students. Provide misconceptions that students may have with these learning expectations that a teacher should be mindful of when assessing students.

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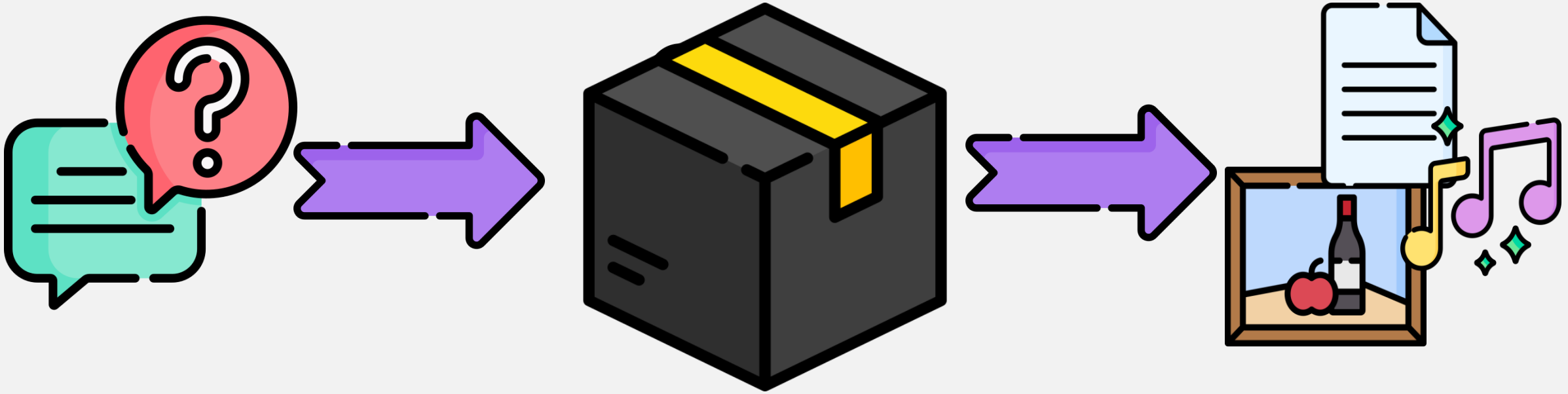

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Artificial Intelligence (AI)

- creating machines or software that have the capability of imitating intelligent human behaviour.

Machine Learning (ML)

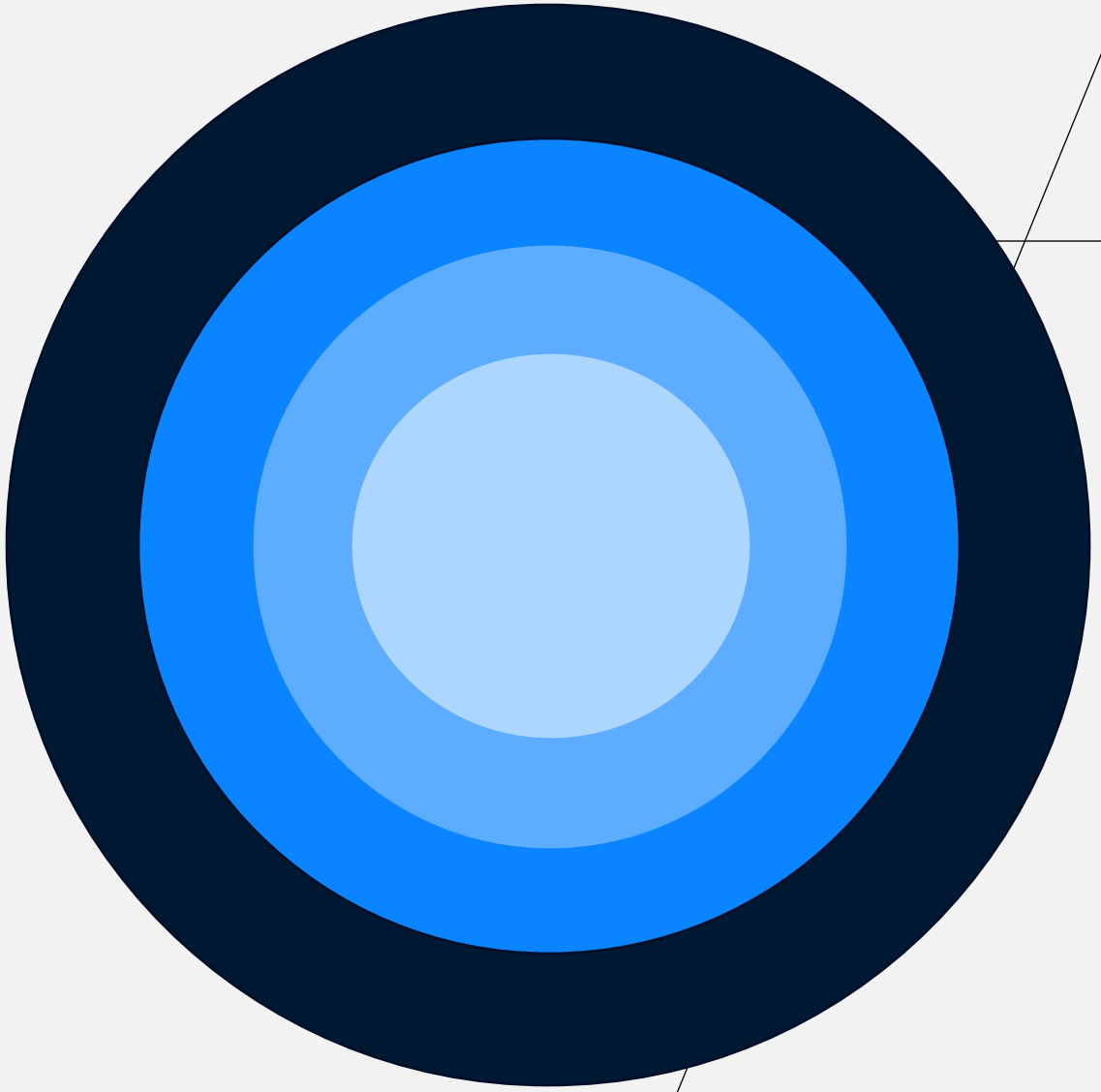
- involves training algorithms to learn from data and improve their performance over time without being explicitly programmed for each task

Neural Networks

- process data in a way that mimics how human brains work, like recognizing patterns

Generative AI (GenAI)

- uses neural networks to create new content, such as images, text, or music; learns from patterns in existing data and generates new, similar data.



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Artificial Intelligence (AI)

- Entire school with different classes and activities

Machine Learning (ML)

- Special class called "Learning Club", students learn new things by practicing and getting better over time

Neural Networks

- In learning club, group of students working on a project; each student has different job but work together (like neural network)

Generative AI (GenAI)

- In learning club, this group of students specifically create new content like text, or images

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What insights or questions do you have right now?

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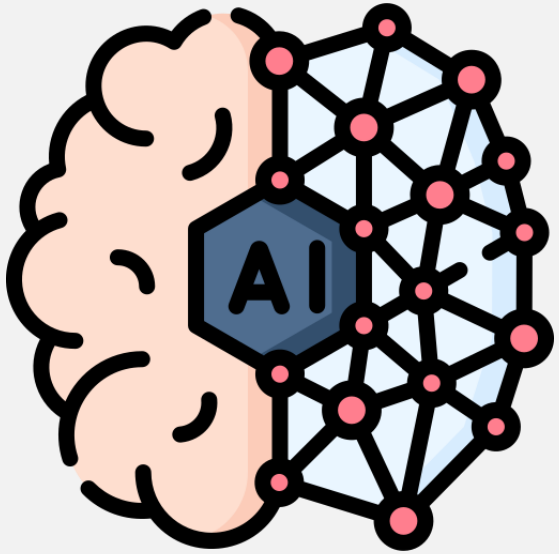

Artificial Intelligence (AI) is when computers are programmed to do things that usually need human intelligence

Generative AI (GenAI) is a type of artificial intelligence that can create new content, like text, images, or music, based on what it has learned from existing data that it was trained on.

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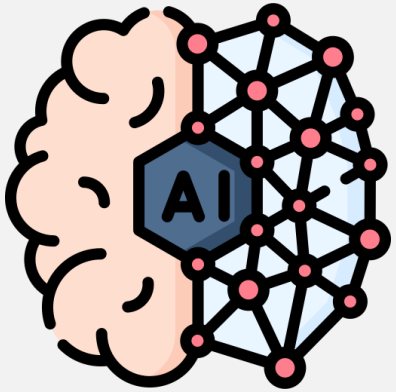
Ways GenAI Learns



Supervised Learning

Trained with labeled data – model is told what the data is and what it should do based on that data.

Unsupervised Learning

Learning from unlabeled data – model analyze patterns, structures, and relationships within the data to understand context and generate new content.

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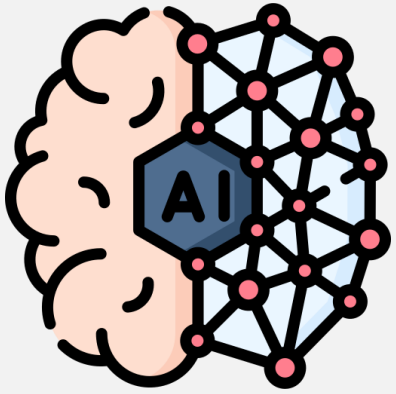
Explaining to a 10-year old



Supervised Learning

Think of this like having a teacher who gives you a lot of examples and tells you exactly what to do. For instance, if you're learning to play a card game, the teacher shows you many cards and tells you which ones are good and which ones are bad. You learn by looking at these examples and understanding the rules.

Teacher gives you examples and tells you what to do.

Unsupervised Learning

This is like having a teacher who gives you a bunch of cards but doesn't tell you anything about them. You have to figure out the rules on your own by looking for patterns. Maybe you notice that some cards have similar colors or shapes, and you group them together based on these patterns.

Teacher gives you things to figure out on your own.

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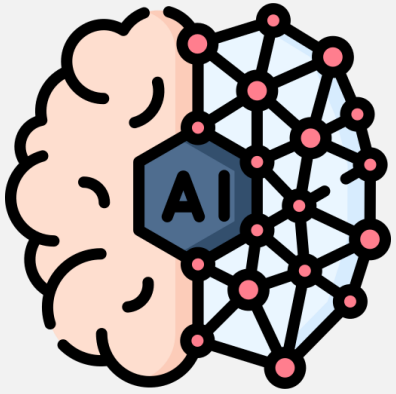
GenAI Model Examples



Text Generation

Models like GPT-4 are trained on vast amounts of text data to generate human-like text. They use both supervised learning (predicting the next word) and unsupervised learning (understanding context and structure).

Image Generation

Models like DALL-E generate images from text descriptions. They learn from labeled images and text pairs (supervised) and also understand patterns in large datasets of images (unsupervised).

Music Generation

Models like Google's MusicLM can create music by learning from existing compositions. They analyze patterns in melodies, harmonies, and rhythms to generate new pieces.

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GPT – GENERATIVE PRE-TRAINED TRANSFORMER

Generative means the model can generate new text

Pre-trained means the model has been trained on lots of data beforehand

Transformer is the architecture that enables it to understand and generate human-like text

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CHECK THIS OUT

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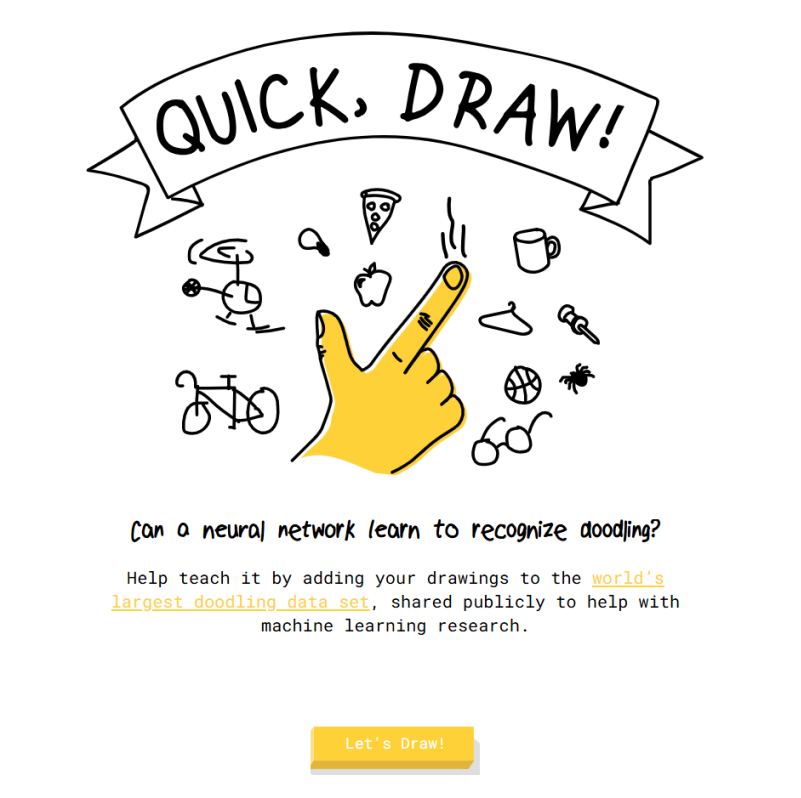
AN EXAMPLE OF SUPERVISED LEARNING



Game has been trained on a large dataset of doodles that are labeled with what they represent, like "cat," "house," or "tree." This means the neural network learned to recognize patterns in the drawings based on these labeled examples.

When you draw something, the game compares your drawing to the examples it has seen before and tries to guess what you're drawing based on its training.

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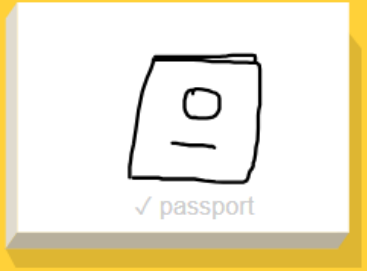
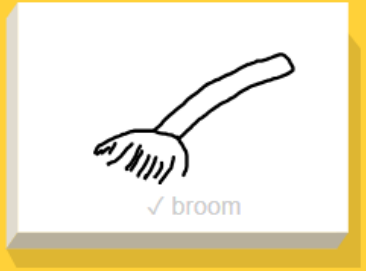
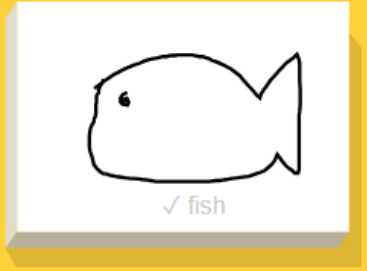
Well drawn!

Our neural net figured out 5 of your doodles.
But it saw something else in the other 1.
Select one to see what it saw, and visit the data to see 50 million drawings made by other real people on the internet.







Share your drawings

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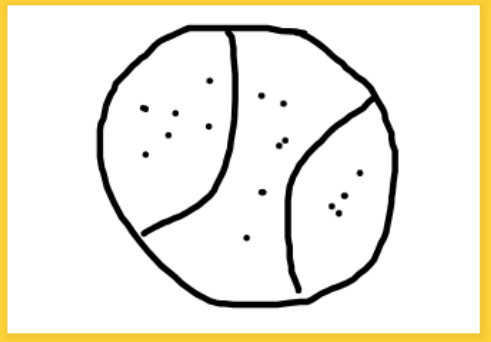
You were asked to draw basketball

You drew this, and the neural net didn't recognize it.



It thought your drawing looked more like these:

Closest match
baseball

2nd closest match
watermelon

3rd closest match
cookie

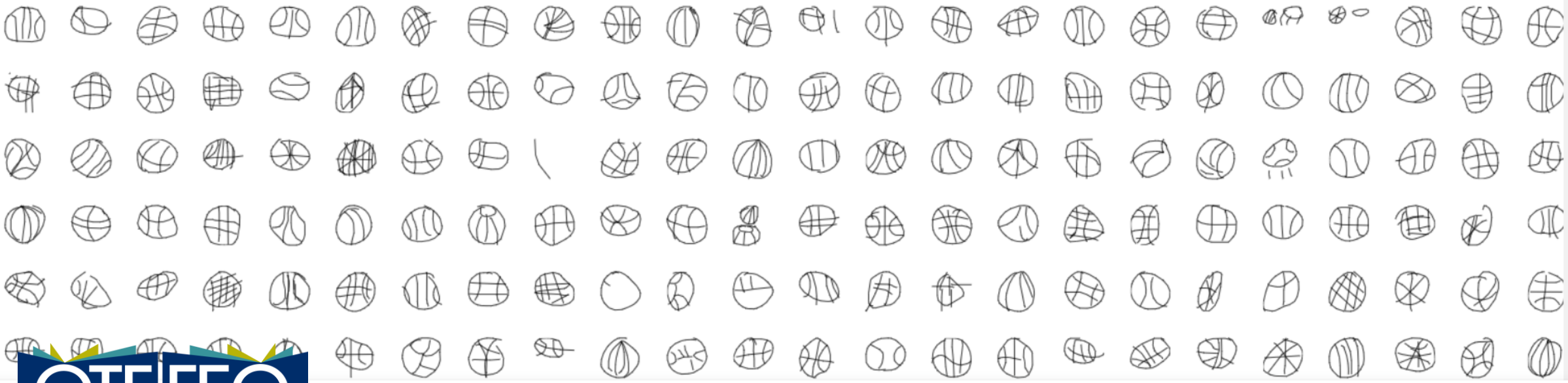
Now visualizing: basketball

Randomize

You are looking at 126,372 basketball drawings made by real people... on the internet.

If you see something that shouldn't be here, simply select the drawing and click the flag icon.

It will help us make the collection better for everyone.



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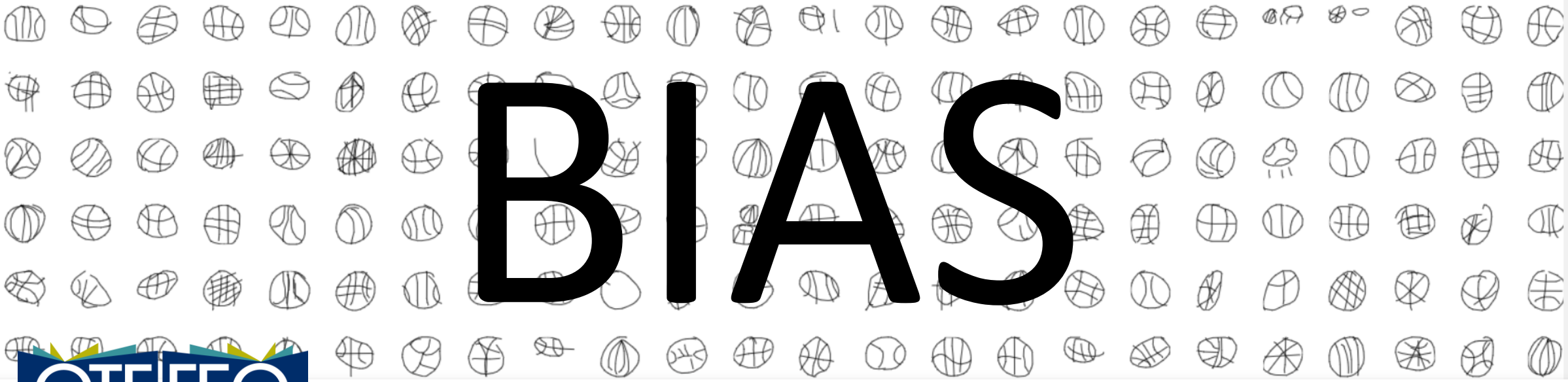

BIAS

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What are these doodles of?

How can you tell?

Do toilets look the same all over the world?

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What if someone's toilet looked like this?

Would a doodle of this be eliminated from the dataset?

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COMMONLY CITED CONSIDERATIONS AND CONCERNS

- GenAI is an unregulated technology
- GenAI is owned by corporations
- Uncertain of how GenAI works (e.g., how GenAI models make decisions)
- Threats to professionalism of teaching
- Financial costs of using certain GenAI models
- Insufficient training or exploration on how GenAI can be used in practice
- Increase of student dependence on GenAI for learning and completing school work
- Insufficient protection of teacher and student personal data and privacy when using GenAI
- Concerns with data that GenAI is trained on (e.g., biases in data sets that can negatively impact student learning and well-being)

Best Practices for AI Usage

- **Check for Bias:** AI might occasionally produce biased or incorrect content. Always double-check before sharing with students.
- **The 80-20 Approach:** Use AI for initial work, but make sure to add your final touch, review for bias and accuracy, and contextualize appropriately for the last 20%.
- **Your Judgment Matters:** See AI-generated content as a starting point, not the final version. Always adhere to your school's guidelines.
- **Protect Privacy:** Don't include personal student details like names or addresses. We strive to promptly remove any accidentally submitted information.

I Acknowledge ✓

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PLACES FOR POSSIBLE FOLLOW-UP LEARNING

Association for Media Literacy

- Webinars
- Podcasts

Cult of Pedagogy Blog

- Blog posts

PARTING ADVICE

Be judicious about how you and your students use GenAI

Remember:

- GenAI is a tool that we use and it also uses us
- GenAI should always be used advance and enrich student learning
- Teaching is more than what GenAI can do

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THANK YOU

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